

PATENT ABSTRACTS OF JAPAN

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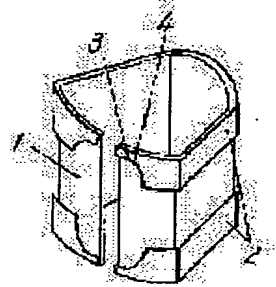
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(54) SLOT INSULATING PAPER FOR MOTOR

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a slot insulating paper for motor, such that the front corners of its folded sections do not protrude from the outer or inner periphery of a stator by using a manufacturing method with which the insulating paper can be manufactured with high workability.

SOLUTION: Slot insulating paper 1 has folded sections 2 at its upper and lower ends, and the front-end corners of the folded sections 2 are prevented from protruding from the outer or inner periphery of a stator by providing notched sections 4, having components which are parallel or nearly parallel to the folded sections 2 to the front-end corners. In addition, the workability of the manufacturing work of the insulating paper is improved, because the cutting position of the insulating paper 1 can be set near the straight or nearly straight components of the notches 4 at the manufacturing of the insulating paper 1.



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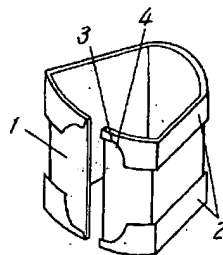
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(54) 【発明の名称】 電動機のスロット絶縁紙

(57) 【要約】

【課題】 折返し部の先端角部が固定子の外周または内周から出ない電動機のスロット絶縁紙を作業性の良い製造方法で提供することを第1の目的とする。

【解決手段】 スロット絶縁紙1は、その上部と下部に折返し部2を有し、折返し部2の先端角部に折返しと平行または平行に近い成分3を持つ切欠き4を設けることで、折返し部の先端角部が固定子の外周または内周から出ることを防止し、また製造時にスロット絶縁紙1の寸断位置を切欠き4の直線または直線に近い成分に置くことができるので、作業性がよくなる。



1 スロット絶縁紙

2 折返し部

3 折返しと平行または
平行に近い成分

4 切欠き

【特許請求の範囲】

【請求項1】 固定子スロットから軸方向に突出する折返し部を有し、スロット開口部近傍の前記折返し部の先端角部に、折返しと平行な成分または平行に近い成分を持つ切欠きを備えた電動機のスロット絶縁紙。

【請求項2】 固定子スロットから軸方向に突出する折返し部を有し、スロット開口部近傍の前記折返し部の先端角部のみが、固着されている電動機のスロット絶縁紙。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】本発明は電動機のスロット絶縁紙に関する。

【0002】

【従来の技術】従来、電動機のスロット絶縁紙として図7～図9に示すものが知られていた。以下、その構成について図を参照しながら説明する。

【0003】図7および図8に示すように、固定子スロット101の内面に沿う形状に成形されたスロット絶縁紙102は、その上部と下部に折返し部103を備えることにより、固定子スロット101に挿入された際、上下の折返し部103の間に固定子104を挟み込む形態になっている。

【0004】

【発明が解決しようとする課題】このような従来の電動機のスロット絶縁紙102では、固定子スロット101が固定子104の外周または内周に接近して配置され、スロット開口部105近傍での固定子104の回転方向の寸法が非常に小さい固定子では折返し部103の先端角部が、固定子104の外周または内周からはみ出し回転子（図示せず）に当たるといった課題があった。そこで折返し部103の先端角部にCカットの切欠き106を設けることが考えられたが、図9に示すようにスロット絶縁紙102を製造する工程において、リボン状に繋がった一連のスロット絶縁紙102aから、隣合うCカットにより形成される三角形の切欠き106aを裁断する位置を、スロット絶縁紙をその寸法値に寸断する位置107に三角形の頂点が丁度合うように正確に位置合わせをする必要があり、作業性が悪いという課題があった。

【0005】また、裁断した切欠き106aがスロット絶縁紙102に付いたまま、スロット絶縁紙102が固定子スロット101に挿入され、電動機の組立不良が発生するという課題も考えられた。

【0006】本発明は、このような従来の課題を解決するものであり、折返し部の先端角部が固定子の外周または内周から出ない電動機のスロット絶縁紙を作業性の良い製造方法で提供することを第1の目的とする。

【0007】また、第2の目的は、スロット絶縁紙の形状を特殊なものにせず、切欠きを無くして、切欠きの端

材による電動機の組立不良を防止することにある。

【0008】

【課題を解決するための手段】本発明の電動機のスロット絶縁紙は上記目的を達成するために、折返し部の先端角部に折返しと平行または平行に近い成分を持つ切欠きを備えたものである。

【0009】この本発明によれば、折返し部の先端角部が固定子の外周または内周から出ない電動機のスロット絶縁紙が作業性の良い製造方法で得られる。

【0010】また他の手段は、折返し部の先端角部に切欠きを設けず、折返し部の先端角部を固着したものである。

【0011】そして本発明によれば、切欠きの端材による電動機の組立不良を防止することが可能となる。

【0012】

【発明の実施の形態】本発明の請求項1に記載の発明は、固定子スロットから軸方向に突出する折返し部を有し、スロット開口部近傍の折返し部の先端角部に折返しと平行または平行に近い成分を持つ切欠きを備えたもので、この切欠きにより折返し部の先端角部が固定子の周から出ない様にできるという作用を有し、また、切欠きの中に折返しと平行または平行に近い成分を持つことで、製造工程での作業性が向上する作用を有する。

【0013】また折返し部の先端角部に切欠きを設けず、折返し部の先端角部を固着することにより切欠きを無くすることができ、切欠きの端材による電動機の組立不良を防止するという作用を有する。

【0014】以下、本発明の実施の形態について図1～図6を参照しながら説明する。

（第1の実施の形態）図1および図2に示すように、固定子スロット101の内面に沿う形状に成形されたスロット絶縁紙1は、その上部と下部に折返し部2を有し、スロット開口部105近傍の折返し部2の先端角部に折返しと平行または平行に近い成分3を持つ切欠き4を4ヶ所設けることにより形成される。

【0015】上記構成において、スロット絶縁紙1は固定子スロット101に挿入されると、上下の折返し部2の間に固定子104を挟む形となり、折返し部2は固定子スロット101の表面から軸方向に突出する。

【0016】そこでスロット開口部105近傍の折返し部2の先端角部は、構造上開きぎみとなるが、折返し部2の先端角部に折返しと平行または平行に近い成分3を持つ切欠き4を設け折返し部2の先端角部を裁断することで、固定子スロット101が固定子104の外周に接近して配置され、スロット開口部105近傍での固定子104の回転方向の寸法が非常に小さい固定子104でも、折返し部の先端角部が開き固定子104の外周から出ることを防止できる。

【0017】なお、本実施の形態では、固定子スロット101が固定子104の外周に接近して配置されている

が、内周に接近して配置された場合も同様の作用を有する。

【0018】また、スロット絶縁紙1を製造する工程において、図3に示すようにリボン状に繋がった一連のスロット絶縁紙1aから、スロット絶縁紙1をその寸法値に寸断する位置5は、隣り合う切欠き4により形成される裁断用切欠き4aの中の、折返しと平行または平行に近い成分3により形成される、直線または直線に近い成分3a上となるので、寸断位置5と裁断用切欠き4aの位置を特別に位置合わせする必要はなく作業性が良い。

【0019】(第2の実施の形態)図4に示すように、スロット絶縁紙6はスロット開口部105近傍の折返し部2の先端角部を、超音波溶着にて固着した固着部7を4ヶ所有する。

【0020】図5に示すように、スロット絶縁紙6は、スロット開口部105近傍の折返し部2の先端角部が固着されているため、折返し部2の先端角部が開き固定子104の外周から出ることを防止できる。

【0021】また、スロット絶縁紙6を製造する工程においても、図6に示すようにリボン状に繋がった一連のスロット絶縁紙6aから、スロット絶縁紙6をその寸法値に寸断する位置5は、隣り合う固着部7により形成される、連結された固着部7a上となるので、寸断位置5と連結された固着部7aの位置を特別に位置合わせする必要はなく、作業性が良い。

【0022】また、切欠き部がないため切欠きの端材が発生しないので、組立時に電動機の内部に切欠きの端材が入り込む事がない。

【0023】なお、実施の形態2では、固着部7の固着の方法に超音波溶着を用いたが、熱溶着を用いても得られる効果は同じである。

【0024】

【発明の効果】以上のように本発明によれば、スロット開口部近傍の折返し部の先端角部に折返しと平行または平行に近い成分を持つ切欠きを設けることで、固定子スロットが固定子の外周または内周に接近して配置され、スロット開口部近傍での固定子の回転子方向の寸法が非

常に小さい固定子でも、折返し部の先端角部が固定子の外周または内周から出ない電動機のスロット絶縁紙を、製造工程上で特別な位置合わせの作業をすること無く提供できる。

【0025】また、折返し部の先端角部を固着することで切欠きを無くすることができ、切欠きの端材による電動機の組立不良を防止するという効果が得られる。

【図面の簡単な説明】

【図1】本発明の第1の実施の形態の電動機のスロット絶縁紙の斜視図

【図2】同第1の実施の形態の電動機のスロット絶縁紙が固定子スロットに装着されている状態を示す概略図

【図3】同第1の実施の形態の電動機のスロット絶縁紙の製造時の概略図

【図4】本発明の第2の実施の形態の電動機のスロット絶縁紙の斜視図

【図5】同第2の実施の形態の電動機のスロット絶縁紙が固定子スロットに装着されている状態を示す概略図

【図6】同第2の実施の形態の電動機のスロット絶縁紙の製造時の概略図

【図7】従来の電動機のスロット絶縁紙の斜視図

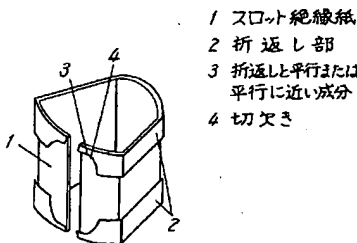
【図8】従来の電動機のスロット絶縁紙が固定子スロットに装着されている状態を示す概略図

【図9】従来の折返し先端角部に切欠きを設けた電動機のスロット絶縁紙の製造時の概略図

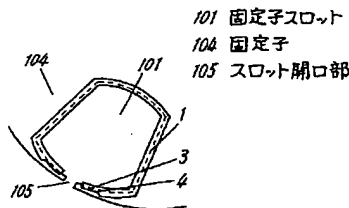
【符号の説明】

- 1 スロット絶縁紙
- 1a 繋がった一連のスロット絶縁紙
- 2 折返し部
- 3 折返しと平行または平行に近い成分
- 3a 直線または直線に近い成分
- 4 切欠き
- 4a 裁断用切欠き
- 5 寸断位置
- 101 固定子スロット
- 104 固定子
- 105 スロット開口部

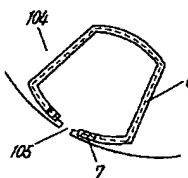
【図1】



【図2】

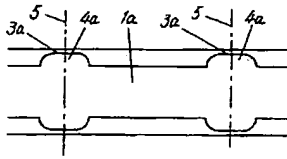


【図5】

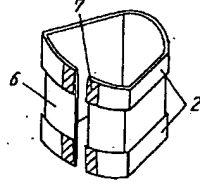


【図3】

3a 直線または
直線に近い成分
5 寸断位置

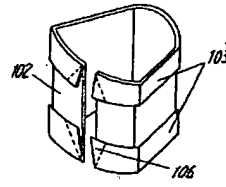


【図4】

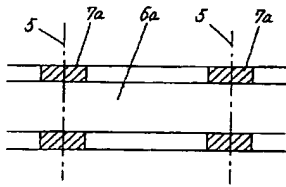


【図7】

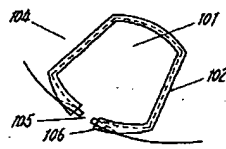
7 固着部



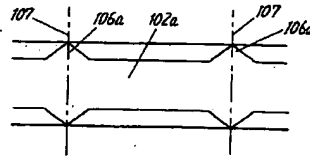
【図6】



【図8】



【図9】



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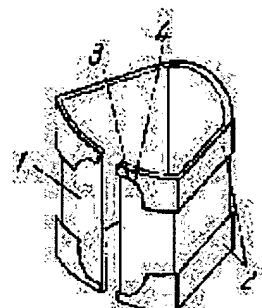
(72)Inventor : NAKAHARA TORU

(54) SLOT INSULATING PAPER FOR MOTOR

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a slot insulating paper for motor, such that the front corners of its folded sections do not protrude from the outer or inner periphery of a stator by using a manufacturing method with which the insulating paper can be manufactured with high workability.

SOLUTION: Slot insulating paper 1 has folded sections 2 at its upper and lower ends, and the front-end corners of the folded sections 2 are prevented from protruding from the outer or inner periphery of a stator by providing notched sections 4, having components which are parallel or nearly parallel to the folded sections 2 to the front-end corners. In addition, the workability of the manufacturing work of the insulating paper is improved, because the cutting position of the insulating paper 1 can be set near the straight or nearly straight components of the notches 4 at the manufacturing of the insulating paper 1.



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CLAIMS

[Claim(s)]

[Claim 1] Slot insulation paper of a motor equipped with a notch which has the cuff section which projects in shaft orientations from a stator slot, and has a component parallel to a cuff, or a component near in parallel in the point-angle section of said cuff section near the slot opening.

[Claim 2] Slot insulation paper of a motor which had the cuff section which projects in shaft orientations from a stator slot, and only the point-angle section of said cuff section near the slot opening has fixed.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] This invention relates to the slot insulation paper of a motor.

[0002]

[Description of the Prior Art] Conventionally, what is shown in drawing 7 - drawing 9 as slot insulation paper of a motor was known. Hereafter, it explains, referring to drawing about the configuration.

[0003] As shown in drawing 7 and drawing 8, when the slot insulation paper 102 fabricated by the configuration in alignment with the inside of the stator slot 101 is inserted in the stator slot 101 by equipping the upper part and lower part with the section 103 by return, it is the gestalt which puts a stator 104 between the up-and-down cuff sections 103.

[0004]

[Problem(s) to be Solved by the Invention] In such slot insulation paper 102 of the conventional motor, the stator slot 101 approached the periphery or inner circumference of a stator 104, and has been arranged, and the technical problem that the point-angle section of the section 103 was equivalent to a flash rotator (not shown) from the periphery or inner circumference of a stator 104 occurred by return in the stator with the very small size of the direction of a rotator of the about 105 slot opening stator 104. Then, although it was possible to form the notch 106 of C cut in the point-angle section of the section 103 by return In the production process which manufactures the slot insulation paper 102 as shown in drawing 9, from a series of slot insulation paper 102a connected in the shape of a ribbon Alignment needed to be correctly carried out so that triangular top-most vertices might suit exactly the location 107 which cuts slot insulation paper in pieces to the size value in the location which judges notch 106a of the triangle formed of a ***** C cut, and the technical problem that workability was bad occurred.

[0005] Moreover, while judged notch 106a had been attached to the slot insulation paper 102, the slot insulation paper 102 was inserted in the stator slot 101, and the technical problem that the poor assembly of a motor occurred was also considered.

[0006] This invention does not solve such a conventional technical problem, and sets it as the 1st purpose to offer the slot insulation paper of the motor to which the point-angle section of the section does not come out of the periphery or inner circumference of a stator by return by the good manufacture method of workability.

[0007] Moreover, the 2nd purpose is not to make the configuration of slot insulation paper special, but lose a notch, and prevent the poor assembly of the motor by the edge material of a notch.

[0008]

[Means for Solving the Problem] Slot insulation paper of a motor of this invention equips the point-angle section of the section with a notch with a component parallel to a cuff, or near in parallel by return, in order to attain the above-mentioned purpose.

[0009] According to this this invention, slot insulation paper of a motor to which the point-angle section of the section does not come out of a periphery or inner circumference of a stator by return is obtained by good manufacture method of workability.

[0010] Moreover, other means do not prepare a notch in the point-angle section of the section by return, but fix the point-angle section of the section by return.

[0011] And according to this invention, it becomes possible to prevent the poor assembly of a motor by edge material of a notch.

[0012]

[Embodiment of the Invention] It is the thing equipped with the notch which invention of this invention according to claim 1 has the cuff section which projects in shaft orientations from a stator slot, and has a component parallel to a

cuff, or near in parallel in the point-angle section of the cuff section near the slot opening. It has the operation whose workability in a manufacturing process improves by having an operation that the point-angle section of the section can be prevented from coming out of the periphery of a stator by return by this notch, and having a component parallel to a cuff, or near in parallel in a notch.

[0013] Moreover, a notch cannot be prepared in the point-angle section of the section by return, but a notch can be lost by fixing the point-angle section of the section by return, and it has an operation of preventing the poor assembly of the motor by the edge material of a notch.

[0014] Hereafter, it explains, referring to drawing 1 - drawing 6 about the gestalt of operation of this invention.

(Gestalt of the 1st operation) As shown in drawing 1 and drawing 2, the slot insulation paper 1 fabricated by the configuration in alignment with the inside of the stator slot 101 has the section 2 by return in the upper part and lower part, and is formed by forming four notches 4 with the component 3 parallel to a cuff, or near the point-angle section of the about 105 slot opening cuff section 2 in parallel.

[0015] In the above-mentioned configuration, if the slot insulation paper 1 is inserted in the stator slot 101, it becomes the form which sandwiches a stator 104 between the up-and-down cuff sections 2, and the section 2 projects in shaft orientations from the surface of the stator slot 101 by return.

[0016] Then, although the point-angle section of the about 105 slot opening cuff section 2 serves as structure top aperture feeling By forming the notch 4 with the component 3 parallel to a cuff, or near in parallel in the point-angle section of the section 2 by return, and judging the point-angle section of the section 2 by return The stator slot 101 approaches the periphery of a stator 104, and is arranged, and it can prevent that the point-angle section of the section comes the periphery of the aperture stator 104 also out of the stator 104 with the very small size of the direction of a rotator of the about 105 slot opening stator 104 by return.

[0017] In addition, although the stator slot 101 approaches the periphery of a stator 104 and is arranged with the gestalt of this operation, also when inner circumference is approached and it has been arranged, it has the same operation.

[0018] Moreover, the location 5 which cuts the slot insulation paper 1 in pieces to the size value from a series of slot insulation paper 1a connected in the shape of a ribbon in the production process which manufactures the slot insulation paper 1 as shown in drawing 3 Since it becomes the component 3a top near the straight line or straight line formed of the component 3 parallel to a cuff, or near in parallel in notch 4a for decision formed of the adjacent notch 4, it is not necessary to carry out alignment of the cutting-into-pieces location 5 and the location of notch 4a for decision specially, and workability is good.

[0019] (Gestalt of the 2nd operation) As shown in drawing 4, the slot insulation paper 6 has the four fixing sections 7 which fixed the point-angle section of the about 105 slot opening cuff section 2 in ultrasonic welding.

[0020] As shown in drawing 5, since the point-angle section of the about 105 slot opening cuff section 2 has fixed, the slot insulation paper 6 can prevent that the point-angle section of the section 2 comes out of the periphery of the aperture stator 104 by return.

[0021] Moreover, since the location 5 which cuts the slot-insulation paper 6 in pieces to the size value from a series of slot-insulation paper 6a connected in the shape of a ribbon as the production process which manufactures the slot-insulation paper 6 was shown in drawing 6 becomes the fixing section 7a [which was connected] top formed of the adjacent fixing section 7, it does not have to carry out the alignment of the location of fixing section 7a connected with the cutting-into-pieces location 5 specially, and its workability is good.

[0022] Moreover, since there is no notch and the edge material of a notch does not occur, the edge material of a notch does not enter the interior of a motor at the time of assembly.

[0023] In addition, although ultrasonic welding was used for the method of fixing of the fixing section 7 with the gestalt 2 of operation, the effect acquired even if it uses heat joining is the same.

[0024]

[Effect of the Invention] According to this invention, as mentioned above by preparing a notch with the component parallel to a cuff, or near the point-angle section of the cuff section near the slot opening in parallel A stator slot approaches the periphery or inner circumference of a stator, and is arranged. A stator with the very small size of the direction of a rotator of the stator near the slot opening It can provide without doing the activity of alignment special on a manufacturing process for the slot insulation paper of the motor to which the point-angle section of the section does not come out of the periphery or inner circumference of a stator by return.

[0025] Moreover, a notch can be lost by fixing the point-angle section of the section by return, and the effect of preventing the poor assembly of the motor by the edge material of a notch is acquired.

[Translation done.]

* NOTICES *

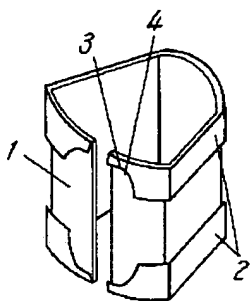
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DRAWINGS

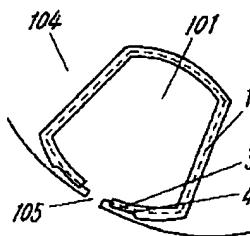
[Drawing 1]

- 1 スロット絶縁紙
- 2 折返し部
- 3 折返しと平行または
平行に近い成分
- 4 切欠き

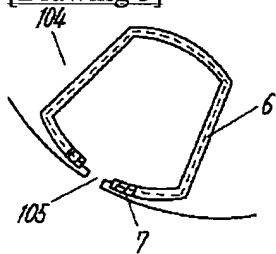


[Drawing 2]

- 101 固定子スロット
- 104 固定子
- 105 スロット開口部

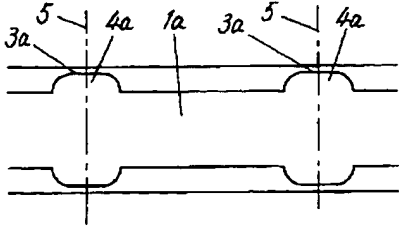


[Drawing 5]



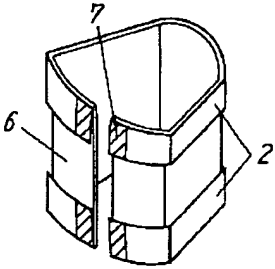
[Drawing 3]

3a 直線または
直線に近い成分
5 寸断位置

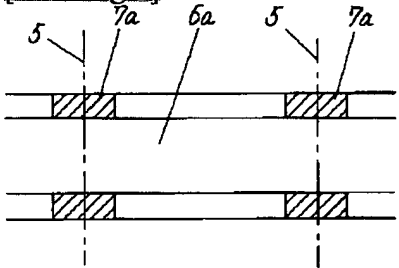


[Drawing 4]

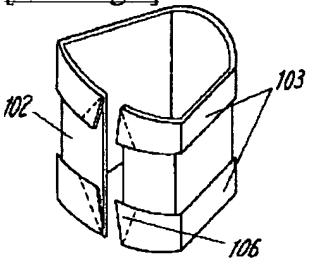
7 固着部



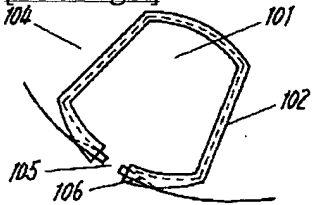
[Drawing 6]



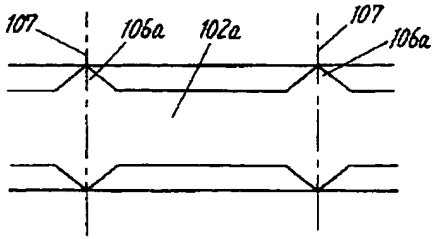
[Drawing 7]



[Drawing 8]



[Drawing 9]



[Translation done.]